CLAIMS:

1. A visual display comprising:

- a cathode plate in the form of a field effect emission device including :
  - a substrate and
  - an emission layer on one face of the substrate, the emission layer having:
    - a multiplicity of emitters and gates, arranged as an array of emission pixels and
    - conductive connections in the emission layer to the emitters and the gates;
  - the substrate having:
    - conductive vias provided through the substrate or at least a front layer thereof to at least some of the said conductive connections in the emission layer for electrical connection to their emitters and gates and
- an anode plate;

characterised in that it includes:

- a back plate, the cathode plate being carried on the front side of the back plate; and
- a frame connecting the back plate to the anode plate.

2. A visual display according to claim 1, wherein the frame extends peripherally around the cathode plate.

3. A visual display according to claim 1, wherein the frame is constructed as a separate member and then jointed to the back plate.

4. A visual display according to claim 3, wherein the frame is joined to the back plate by frit sealing.

5. A visual display according to claim 1, wherein the frame and the back plate are provided as a single structure, the frame being distinguishable from the back plate as that part of the structure extending further towards the anode plate from a main body of the structure which constitutes the back plate.

6. A visual display according to claim 1, wherein the frame and the back plate are laminated from multiple layers of ceramic material.

7. A visual display according to claim 6, wherein the layers have been are laminated together in the green state and fired together to unify them into a single structure.

8. A visual display according to claim 1, wherein the back plate is pressure tight to atmospheric pressure, whereby atmospheric pressure but acts only on the back of the back plate and on the front of the anode to place joint(s) between the frame and the plates under compression.

9. A visual display according to claim 1, wherein, for electrical connection of the anode, the frame incorporates a network of vias extending from one layer to the next and interconnection tracks at interfaces between the layers.

10. A visual display according to claim 1, wherein the substrate of the cathode plate is a multilayer substrate having a front substrate layer and at least one additional substrate layer, with conductive vias provided through the front layer and the or each additional layer and with electrical interconnection tracks at at least some of the interface(s) between adjacent layers so arranged that a front layer via is offset from a via in a back one of the additional layer(s) to which it is electrically connected by the interconnection tracks.

11. A visual display according to claim 1, wherein the substrate of the cathode plate is a multilayer substrate having a front substrate layer and at least one additional substrate layer, with conductive vias provided through the front layer and the or each additional layer and with electrical interconnection tracks at at least some of the interface(s) between adjacent layers so arranged that the substrate includes two layers with vias in one aligned with vias in the next.

12. A visual display according to claim 1, wherein the substrate of the cathode plate is a substrate having only a single layer, with the emission layer built up on it.

13. A visual display according to claim 1, wherein the cathode plate includes a thick ceramic foundation layer with one or more additional thinner ceramic layers laminated to one or other side of the thicker, foundation layer.

14. A visual display according to claim 1, wherein the back plate includes a thick foundation layer with additional layer(s) laminated to either or both sides thereof.

15. A visual display according to claim 14, wherein the back plate layers have vias whereby their pitches fan out towards a back layer, with vias in the front layer of the back plate being offset from those in the back layer thereof.

16. A visual display according to claim 1, wherein, for connection to the cathode plate, the back plate has vias in a front layer positioned to connect with vias in the back layer of the cathode plate.

17. A visual display according to claim 16, including connection tracks on either or both of the back plate front layer or the cathode plate back layer.

18. A visual display according to claim 16, wherein the vias or the tracks on either or both of the back plate front layer or the cathode plate back layer are connected by solder.

19. A visual display according to claim 16, wherein the vias or the tracks on either or both of the back plate front layer or the cathode plate back layer are connected by a ball grid array.

20. A visual display according to claim 1, including a flowable connection made around the back edge of the cathode plate to the back plate to isolate a thin gap between the face plate and the back plate from the front side of the cathode plate.

21. A visual display according to claim 20, wherein the flowable connection is of solder or frit.

22. A visual display according to claim 20, wherein the vias or the tracks on either or both of the back plate front layer or the cathode plate back layer are connected by solder and the solder for electrical connection and the solder or the frit for edge sealing has a melting point above 300°C and preferably above 320°C.

23. A visual display according to claim 1, wherein, for assembly of the cathode plate to the back plate in correct position for electrical connection:

- the back plate is provided with apertures for handling pins, the apertures being plugged in the finished display and
- the back side of the cathode plate is provided with recesses for the handling pins in register with the apertures.

24. A visual display according to claim 1, wherein the anode plate is sealed to the frame by a fused frit seal.

25. A visual display according to claim 1, wherein the anode plate is sealed to the frame by a fused solder seal.

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